ABSTRACT

An apparatus for measuring a set of frequency-resolved states of polarization (SOP) of an optical signal includes a local oscillator (LO), a polarization scrambler, a coupler for mixing the polarization-scrambled signal with the optical signal to produce a heterodyned signal with a radio frequency (RF) component, and an analyzer for passing a fixed polarization component and resolving the polarization and frequency from the RF component. The apparatus is used for measuring, monitoring or compensating the polarization mode dispersion (PMD) in a working channel of an optical telecommunication system. A method for measuring frequency-resolved SOP of an optical signal includes tuning and polarization-scrambling a local oscillator (LO), mixing the scrambled LO with the optical signal, and resolving the RF signal in frequency and polarization. The method is applied to measure and monitor PMD in a working optical channel, and to dynamically compensate for the PMD.